

Message

**From:** Pearson, Stuart C. [stuart.pearson@woodplc.com]  
**Sent:** 5/22/2019 1:55:44 PM  
**To:** Smallbeck, Donald R. [donald.smallbeck@woodplc.com]; D'Almeida, Carolyn [dAlmeida.Carolyn@epa.gov]; 'JERRARD, CATHERINE V CIV USAF HAF AFCEC/CIBW' [catherine.jerrard@us.af.mil]; 'Wayne Miller' [Miller.Wayne@azdeq.gov]  
**CC:** d p [DPope@css-dynamac.com]; Davis, Eva [Davis.Eva@epa.gov]; GANGNUSS, GREGORY G GS-14 USAF HAF AFCEC/CIBP [gregory.gangnuss@us.af.mil]; Nicole Goers [Nicole.Goers@TechLawInc.com]; 'Brasaemle, Karla' [KBrasaemle@TechLawInc.com]; 'Rohrbaugh, Amanda' [ARohrbaugh@TechLawInc.com]; 'Bo Stewart' [bo@praxis-enviro.com]; William Hughes [William.Hughes@cn-bus.com]; 'steve@uxopro.com' [steve@uxopro.com]; 'Jennings, Eleanor' [Eleanor.Jennings@parsons.com]; 'Panzino, Paula@azdeq.gov' [Panzino.Paula@azdeq.gov]  
**Subject:** RE: ST012 Site Activities

A question came up on yesterday's BCT call concerning the source of the numerical values for the field SRB results. To clarify, this information was taken from the manufacturer's literature that came with the test kits and that Don provided as an attachment in his email below. It is also available on the Hach web site <https://www.hach.com/asset-get.download.jsa?id=16716485755> . I've highlighted and pasted the relevant information below. You can see that we observed the reaction at about three days for UWBZ27 and between six and seven days for LSZ39 (the precipitate formed overnight between days). The precision of this test is limited and should only be viewed as semi-quantitative.

Stu

**Table 1 Approximate bacteria population**

Days to reaction	Approximate SRB population (cfu/mL)	Aggressivity
1	2,200,000	Very high
2	500,000	High
3	115,000	High
4	27,000	High

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Bacteria, Sulfate-reducing, SRB-BART

**Table 1 Approximate bacteria population (continued)**

Days to reaction	Approximate SRB population (cfu/mL)	Aggressivity
5	6000	Moderate
6	1400	Moderate
7	325	Moderate
8	75	Low

**From:** Smallbeck, Donald R.  
**Sent:** Thursday, May 9, 2019 2:34 PM  
**To:** D'Almeida, Carolyn <dAlmeida.Carolyn@epa.gov>; 'JERRARD, CATHERINE V CIV USAF HAF AFCEC/CIBW' <catherine.jerrard@us.af.mil>; 'Wayne Miller' <Miller.Wayne@azdeq.gov>; Pearson, Stuart C. <stuart.pearson@woodplc.com>  
**Cc:** d p <DPope@css-dynamac.com>; Davis, Eva <Davis.Eva@epa.gov>; GANGNUSS, GREGORY G GS-14 USAF HAF AFCEC/CIBP <gregory.gangnuss@us.af.mil>; Nicole Goers <Nicole.Goers@TechLawInc.com>; 'Brasaemle, Karla' <KBrasaemle@TechLawInc.com>; 'Rohrbaugh, Amanda' <ARohrbaugh@TechLawInc.com>; 'Bo Stewart' <bo@praxis-

enviro.com>; William Hughes <William.Hughes@cn-bus.com>; 'steve@uxopro.com' <steve@uxopro.com>; 'Jennings, Eleanor' <Eleanor.Jennings@parsons.com>; 'Panzino.Paula@azdeq.gov' <Panzino.Paula@azdeq.gov>

**Subject:** RE: ST012 Site Activities

Please find attached the field test screening information.

The results to date are

UWBZ27 1.15x10<sup>5</sup> cfu/ml

LSZ39 325 to 1400 cfu/ml

cfu=colony forming units

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**From:** D'Almeida, Carolyn <dAlmeida.Carolyn@epa.gov>

**Sent:** Thursday, May 09, 2019 10:47 AM

**To:** Smallbeck, Donald R. <donald.smallbeck@woodplc.com>; 'JERRARD, CATHERINE V CIV USAF HAF AFCEC/CIBW' <catherine.jerrard@us.af.mil>; 'Wayne Miller' <Miller.Wayne@azdeq.gov>; Pearson, Stuart C. <stuart.pearson@woodplc.com>

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**Subject:** RE: ST012 Site Activities

Thanks Don

Can you tell us what the name/manufacturer of field test kit you are using for sulfate reducers, and compilation of data you have so far for each of the wells?

Carolyn d'Almeida  
Remedial Project Manager  
Federal Facilities Branch (SFD 8-1)  
US EPA Region 9 Laboratory  
1337 South 46<sup>th</sup> Street, Building 201  
Richmond, CA 94804  
(415) 972-3150

*"We can evade reality, but we cannot evade the consequences of evading reality." - Ayn Rand*

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**From:** Smallbeck, Donald R. <donald.smallbeck@woodplc.com>

**Sent:** Wednesday, May 8, 2019 2:07 PM

**To:** D'Almeida, Carolyn <dAlmeida.Carolyn@epa.gov>; 'JERRARD, CATHERINE V CIV USAF HAF AFCEC/CIBW' <catherine.jerrard@us.af.mil>; 'Wayne Miller' <Miller.Wayne@azdeq.gov>; Pearson, Stuart C. <stuart.pearson@woodplc.com>

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Eleanor' <[Eleanor.Jennings@parsons.com](mailto:Eleanor.Jennings@parsons.com)>; 'Panzino.Paula@azdeq.gov' <[Panzino.Paula@azdeq.gov](mailto:Panzino.Paula@azdeq.gov)>

**Subject:** RE: ST012 Site Activities

Carolyn

It is a field screening test kit performed by Wood personnel which has been described in previous BCT presentations. There is no specific report other than the test kit results. I will provide the information associated with the kits in a separate email.

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**From:** D'Almeida, Carolyn <[dAlmeida.Carolyn@epa.gov](mailto:dAlmeida.Carolyn@epa.gov)>

**Sent:** Wednesday, May 08, 2019 2:03 PM

**To:** Smallbeck, Donald R. <[donald.smallbeck@woodplc.com](mailto:donald.smallbeck@woodplc.com)>; 'JERRARD, CATHERINE V CIV USAF HAF AFCEC/CIBW' <[catherine.jerrard@us.af.mil](mailto:catherine.jerrard@us.af.mil)>; 'Wayne Miller' <[Miller.Wayne@azdeq.gov](mailto:Miller.Wayne@azdeq.gov)>; Pearson, Stuart C. <[stuart.pearson@woodplc.com](mailto:stuart.pearson@woodplc.com)>

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**Subject:** RE: ST012 Site Activities

Can we get the field screening data reports indicating presence of sulfate reducers referenced below?  
Thank you.

Carolyn d'Almeida  
Remedial Project Manager  
Federal Facilities Branch (SFD 8-1)  
US EPA Region 9 Laboratory  
1337 South 46<sup>th</sup> Street, Building 201  
Richmond, CA 94804  
(415) 972-3150

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**Sent:** Wednesday, May 8, 2019 1:47 PM

**To:** 'JERRARD, CATHERINE V CIV USAF HAF AFCEC/CIBW' <[catherine.jerrard@us.af.mil](mailto:catherine.jerrard@us.af.mil)>; 'Wayne Miller' <[Miller.Wayne@azdeq.gov](mailto:Miller.Wayne@azdeq.gov)>; D'Almeida, Carolyn <[dAlmeida.Carolyn@epa.gov](mailto:dAlmeida.Carolyn@epa.gov)>; Pearson, Stuart C. <[stuart.pearson@woodplc.com](mailto:stuart.pearson@woodplc.com)>

**Cc:** d p <[DPope@css-dynamac.com](mailto:DPope@css-dynamac.com)>; Davis, Eva <[Davis.Eva@epa.gov](mailto:Davis.Eva@epa.gov)>; GANGNUSS, GREGORY G GS-14 USAF HAF AFCEC/CIBP <[gregory.gangnuss@us.af.mil](mailto:gregory.gangnuss@us.af.mil)>; Nicole Goers <[Nicole.Goers@TechLawInc.com](mailto:Nicole.Goers@TechLawInc.com)>; 'Brasaemle, Karla' <[KBrasaemle@TechLawInc.com](mailto:KBrasaemle@TechLawInc.com)>; 'Rohrbaugh, Amanda' <[ARohrbaugh@TechLawInc.com](mailto:ARohrbaugh@TechLawInc.com)>; 'Bo Stewart' <[bo@praxis-enviro.com](mailto:bo@praxis-enviro.com)>; William Hughes <[William.Hughes@cn-bus.com](mailto:William.Hughes@cn-bus.com)>; 'steve@uxopro.com' <[steve@uxopro.com](mailto:steve@uxopro.com)>; 'Jennings, Eleanor' <[Eleanor.Jennings@parsons.com](mailto:Eleanor.Jennings@parsons.com)>; 'Panzino.Paula@azdeq.gov' <[Panzino.Paula@azdeq.gov](mailto:Panzino.Paula@azdeq.gov)>

**Subject:** ST012 Site Activities

Activities through last week (5/03)

- SVE Operation
- LNAPL checks
- CZ21 repaired with new motor
- Continued extraction and treatment ~50 gpm, ~17.5 million total gallons treated since startup of EBR extraction.

- Operating Extraction Wells: CZ07, CZ21, UWBZ21, UWBZ26, UWBZ27, UWBZ30, LSZ09, LSZ11, LSZ12, LSZ23, LSZ37, LSZ38, LSZ39
- Extraction Wells Down: CZ18, UWBZ22
- CZ07 pumping at approximately 14 gpm.
- Started quarterly GW sampling (except for extraction wells still to be repaired)
- Injections:
  - UWBZ35: 3 tons 4/8, ~1 ton 4/9, 0.7 tons 4/10, 2.7 tons 4/12
  - LSZ08: 2 tons 4/9, 1.3 tons 4/10, 2.3 tons 4/12, 3 tons 4/17, 5 tons 4/18, 2.6 tons 4/25
  - LSZ47: 0.4 tons 4/25, 3 tons 4/26, 4.3 tons 4/29,
  - LSZ48: 5 tons 4/30, 2.5 tons 5/1
  - LSZ49: 3.5 tons 5/1, 2 tons 5/3
- Sulfate screening at LZS39 indicates that the sulfate concentration has achieved breakthrough, is in a range for EBR to commence, (approximately 1,000 mg/L and extraction was stopped on May 2 for aquifer re-equilibration. Field screening (semi-quantitative) of sulfate reducers after pumping was stopped (approximately 7 days) indicated a low level population is present. Approximately 10-14 days after extraction ceases, a Time 0 groundwater sample will be collected to establish a VOCs and inorganic parameter profile.
- Sulfate screening at UWBZ27 indicates that sulfate concentration has achieved breakthrough, is in range for EBR to commence, (approximately 1,000 mg/L and extraction was stopped on May 2 for aquifer re-equilibration. Field screening (semi-quantitative) of sulfate reducers after pumping had stopped (approximately 7 days) indicated a robust population of approximately  $1 \times 10^5$  is present. Approximately 10-14 days after extraction ceases, a Time 0 groundwater sample will be collected to establish a VOCs and inorganic parameter profile.

#### This week (5/6-5/10)

- SVE Operation
- Continue extraction
- LNAPL checks
- CZ07 repair (went down 5/7, repair scheduled 5/9)
- Continue quarterly GW sampling
- Continue injecting sulfate

#### Next Week (5/13-5/17)

- SVE Operation
- LNAPL checks
- Continue extraction
- Repair CZ18 and UWBZ22
- Continue Injecting sulfate
- Time 0 sampling at LSZ39 and UWBZ27

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